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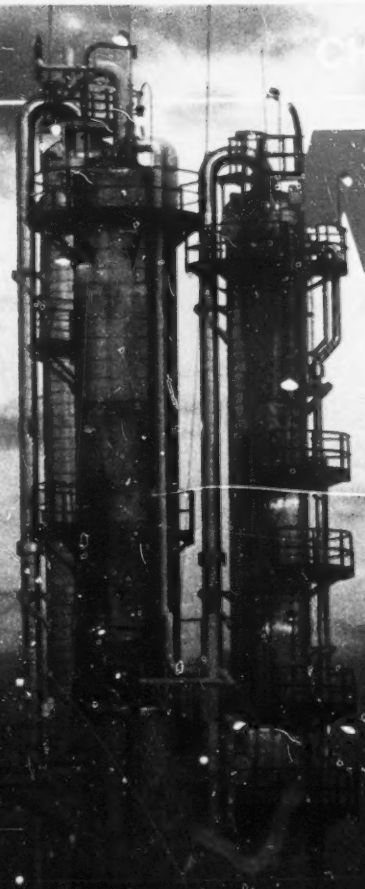
APRIL 7, 1986

CHEMICAL & ENGINEERING

NEWS



U.S. Chemical Industry Reshaping For the Future

Page 8

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News of the Week

■ **OSHA slaps $1.4 million fine on Union Carbide for alleged health and safety violations at its Institute, W.Va., plant.** Page 4

■ **EPA asks Monsanto for more data before issuing an environmental use permit on its genetically engineered microbial pesticide.** Page 5

■ **Denys Henderson will become the chairman of U.K.'s Imperial Chemical Industries in 1987.** Page 5

■ **NSB committee finds serious deterioration of undergraduate education in science, mathematics, and engineering.** Page 6

■ **Decline in crude oil prices gives organic chemicals producers temporary profit boost.** Page 6

Cover: Copolymer Rubber & Chemical Corp.'s EPDM plant at Addis, La.
Photo by Steve Chenn

Government

National Academy of Engineering's choice of John Welch to head its council points up plan to lead U.S. technology policy. **Page 13**

Department of Defense report on Soviet military R&D describes it as huge and catching up with the West in some areas. **Page 14**

Science

Proliferation of software for IBM and compatible personal computers gives them wider use in chemistry labs and triggers the formation of a user group to provide a forum for exchange of ideas. **Page 17**

Technology

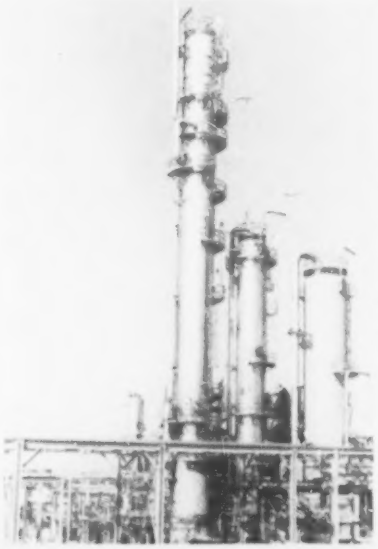
U.K. Atomic Energy Authority, with more control over management, financing of operations, hopes to boost contract R&D. **Page 19**

Books

"**An Environmental Agenda for the Future**" contains advice from experts; "Polycyclic Hydrocarbons and Carcinogenesis" assembles reports from leading researchers. **Page 20**

ACS News

Society honors its 50-year members; each receives a certificate, pin, and free registration at national and regional meetings. **Page 23**



Business

The U.S. chemical industry, in the midst of restructuring, is shifting from commodity chemicals to higher-value-added products, boosting productivity in attempt to remain viable. **Page 8**

Letters 2
Editor's Page 3

Concentrates

Business 7
Government 12
Science/Technology 16

The Departments

People 29
Meetings 30
Newscripts 48

pires, he still will have three years to go before he reaches ICI's mandatory retirement age of 62. So it could be that he will hold the post of chairman for eight years instead of the usual five. □

Undergraduate science, math education scored

Undergraduate education in the U.S. in science, mathematics, and engineering is in serious trouble, according to a report from the National Science Board, the policy-making body of the National Science Foundation. Fixing it will require substantial increases in financial support primarily from "states, municipalities, and the host of supporters of private higher education." It also will require support from NSF at levels nearly as high as those the agency provided in the 1960s.

"The deterioration of collegiate science, mathematics, and engineering education is a grave, long-term threat to the nation's scientific and technical capacity, its industrial and economic competitiveness, and the strength of its national defense," the report says. It was prepared by NSB's Committee on Undergraduate Science & Engineering Education, chaired by Homer Neal, provost at the State University of New York, Stony Brook.

Three areas in particular require immediate attention "of the highest priority," the report notes. Those are laboratory instruction, faculty preparation, and course and curriculum development.

"Laboratory instruction, which is at the heart of science and engineering education, has deteriorated to the point where it is often uninspired, tedious, and dull," the report states. Faculty members are often unable to keep up to date in their discipline or work to improve their teaching skills. And courses and curricula "are frequently out-of-date in content, unimaginative, poorly organized for students with different interests, and fail to reflect recent advances in the understanding of teaching and learning."

NSF's role in tackling these problems should be to catalyze and stimulate efforts of others, the NSB committee says. It calls for establishing a permanent NSF presence in undergraduate mathematics, engineering, and the sciences "no later than 1989." NSF's own expenditures in this area need to be increased $100 million by 1990, according to the report, up from estimated expenditures of $13 million in the current year's budget and no program at all in the early 1980s.

The report acknowledges that it is not going to be easy to get an additional $100 million in NSF support for undergraduate support in the current federal budget climate. Nevertheless, it indicates NSF should go ahead with the recommended programs, even if it has to take the money from other programs to do so. Altogether, state governments, municipalities, industry, and other parts of the federal government will need to spend an extra $1 billion per year "to make an appropriate response to the national needs." □

Report urges $100 million rise for NSF undergraduate programs

$ Millions	1987	1988	1989
Laboratory development	—	$10	$ 20
Instrumentation	$ 2	12	32
Faculty enhancement	7	17	20
Course and curriculum	—	7	13
Comprehensive improvement			10
Undergraduate research	4	12	12
Minority institutions		5	5
Planning			1
TOTAL	$13	$63	$113

Note: Data are for fiscal years

Declining oil prices boost chemical profits

Producers of most big-volume organic chemicals are reveling in improved profits as declining crude oil prices lower their feedstock costs faster than selling prices decline. The good feeling may not last, however, because selling prices are indeed falling and will catch up with declining feedstock prices in a relatively short time.

As a consequence of the oil price drop, the composition of feedstocks to steam crackers, which are sources for major-volume olefins and many aromatics, is being changed. Where possible, more heavy feedstocks obtained from crude oil—naphthas and gas oils—are used in place of light hydrocarbons such as ethane. Prices for ethane have declined less than prices for heavier materials, because natural gas prices haven't fallen so much as those for crude oil. For example, ethane's price at the beginning of April was about 16 cents per gal on the Gulf Coast, down roughly a third from its year-end price, whereas the crude oil price was down by half.

Uncertainties about future feedstock costs play havoc with selling price forecasts at this time. The risk of holding relatively high-priced materials makes inventories undesirable for both producers and consumers of chemicals. Spot buying for immediate consumption is increasing as a share of sales to producers of first- and second-level derivatives of olefins and aromatics.

Currently, inventories of ethylene are low and demand for ethylene continues strong owing to polymer demands. Operating steam crackers are being run at nearly 95% of nameplate capacity. This condition is causing ethylene prices to hold at about 16 cents per lb, although some sales involve determining actual April prices after the month is over. At 16 cents, ethylene prices are down less than 20% from January.

Pressure stays on prices of other olefins such as propylene and butadiene owing to production increases as steam cracker feedstocks shift more toward heavier materials. Propylene prices also are pressured by refinery-produced propylene, now much less in demand as an alkylation feedstock because of very low limits on use of lead alkyls in gasoline. As a result, polypropylene producers are getting better margins.

Larger amounts of benzene are being sold on a spot basis. Contract prices, typically 85 cents per gal, are tied in with large temporary voluntary allowances (discounts) used to bring contract prices closer to spot prices. □